WHAT IS CLAIMED IS:

1.   A communication apparatus for transmitting multiple flows of packet data including bandwidth-guaranteed flow, said apparatus comprising:

timing deciding means for determining transmission timing of packets of said bandwidth-guaranteed flow; and

packet transmitting means for transmitting leading packet data in a packet queue according to accumulation capacity of tokens, at a timing set by said timing deciding means.

2.   A communication apparatus according to Claim 1, wherein packet data at the head of said packet queue is transmitted in the event that the accumulation capacity of said tokens exceeds zero.

3.   A communication apparatus according to Claim 1, wherein said packet transmitting means subtract the size of said transmitted packet from said accumulation capacity of said tokens following transmitting said packet data at the head of said packet queue.

4.   A communication apparatus according to Claim 1, wherein said multiple flows of packet data include best-

effort flow along with bandwidth-guaranteed flow, and wherein said packet transmitting means transmit said best-effort flow packet data at a timing wherein said bandwidth-guaranteed flow packet data is not being transmitted.

5. A communication apparatus according to Claim 4, wherein said packet transmitting means perform transmission of each packet data by time-division multiplex, and wherein transmission timing appropriated to each of said packet data is real-time, and wherein time at which said packet data is actually transmittable is managed as virtual time, and wherein said best-effort flow packet data is transmitted only in the event that said virtual time is ahead of said real-time.

6. A communication apparatus according to Claim 1, wherein said packet transmitting means select said packet queue from a plurality of said bandwidth-guaranteed flow packet queues by procedures established beforehand, and transmit packet data at the head of the packet queue of said selected flow.

7. A communication apparatus according to Claim 1, wherein said timing deciding means comprise:
a timer for generating timing for managing transmission

time; and

control means for determining the transmission timing for each flow, based on time information from said timer and information of each flow.

8. A communication apparatus according to Claim 1, wherein further comprising packet enqueue means for enqueuing packets to packet queues provided to flows to which said packets belong, according to identifiers of each of said packets.

9. A communication apparatus according to Claim 1, wherein the data length of said packet data is fixed.

10. A communication apparatus according to Claim 1, wherein the data length of said packet data is variable.

11. A communication method for transmitting multiple flows of packet data including bandwidth-guaranteed flow, said method comprising:

a timing deciding step for determining transmission timing of packets of said bandwidth-guaranteed flow by time-division multiplexing; and

a packet transmitting step for transmitting leading packet data in a packet queue according to accumulation

capacity of tokens, at said timing decided upon.

12. A communication method according to Claim 11, wherein packet data at the head of said packet queue is transmitted in the event that the accumulation capacity of said tokens exceeds zero.

13. A communication method according to Claim 11, wherein the size of said transmitted packet is subtracted from said accumulation capacity of said tokens following transmitting said packet data at the head of said packet queue.

14. A communication method according to Claim 11, wherein said multiple flows of packet data include best-effort flow along with bandwidth-guaranteed flow, and wherein said best-effort flow packet data is transmitted in said packet transmitting step at a timing wherein said bandwidth-guaranteed flow packet data is not being transmitted.

15. A communication method according to Claim 14, wherein transmission timing appropriated to each of said packet data is real-time, and wherein time at which said packet data is actually transmittable is managed as virtual

time, and wherein said best-effort flow packet data is transmitted only in the event that said virtual time is ahead of said real-time.

16. A communication method according to Claim 11, wherein said packet queue is selected from a plurality of said bandwidth-guaranteed flow packet queues by procedures established beforehand, and packet data at the head of the packet queue of said selected flow is transmitted.

17. A communication method according to Claim 11, wherein input packets are input to packet queues provided to flows to which said packets belong, according to identifiers of each of said packets.